MOBILE IO INPUT AND OUTPUT FOR SMARTPHONES, TABLET, AND WIRELESS DEVICES INCLUDING TOUCH SCREEN, VOICE, PEN, AND GESTURES

BACKGROUND OF THE INVENTION

The input and output (I/O) methods for electronic devices are limited and may be difficult to use on tablet computers, smartphones, cellular telephones and various mobile devices. Effective input and output methods are relevant for authentication, command, and control functions of the device. Keyboards, keypads, and other touch based input and output methods on a cellular telephone or mobile device (CT/MD) may be difficult to actuate due to the size of a key and the size of a person's finger or pen-based stylus. Entry on such a device may result in the incorrect key selected due to a misalignment between the user's finger or pen and the screen. The present disclosure relates to mobile devices including cellular telephones, smart phones, tablet computers, hybrid tablet and smart phones, wireless devices, or handheld computing devices. The devices may include a plurality of radios for wireless local area network and wide area network communication including WiFi, 802.11 (any variant), Bluetooth, NFC, or other communication means.

Further, individuals using CT/MDs may find themselves in situations where it is difficult to devote their full attention to interacting with the CT/MD. The lack of attention to the operations on the CT/MD may further result in difficulty with input and output and incorrect operations. A lack of attention may lead to inadvertent dialing on a cell phone. Alternatively, when too much attention is dedicated to a task such as authentication it may become cumbersome, monotonous, and repetitive. Therefore, a diversity of authentication methods is needed for greater security and engagement.

SUMMARY OF THE INVENTION

It is an aspect of the present disclosure to enable more efficient and rich input and output on smartphones, cellular telephones, tablet computers, and various mobile devices. The CT/MD may include the functions of a PDA. The device may use a plurality of functions on the device including an image camera, front facing camera, back facing camera, video camera, eye tracking software, microphone, and fingerprint reader. The device may be capable of multimedia play including video, music, games, voice recording, video recording, still picture capture, streaming music, streaming video, spreadsheet applications, note taking, banking applications, and other productivity tools.

It is yet another aspect of the disclosure for the device to be configured with a touch sensitive display. The touch sensitive display may be comprised of layers of sensors and protective glass, protective plastic, LCD, Super LCD, OLED, AMOLED, Super AMOLED, Backlit LED, color filters, polarizers, active matrix systems, in plane switching, or TFT. The touch screen display may be configured with a setting that adjusts the sensitivity of the display and turns on multi-touch.

It is an aspect of the present disclosure to enable real time photo and video acquisition and real time sharing of the photos and videos with a server for processing, storage, and sharing to other CT/MDs, servers or cloud. The pictures and videos may be edited and processed on the CT/MD or server. The CT/MD or server may recognize the photos, crop the images, filter the images, enhance lighting, or perform other actions.

Predictive Text System:

It is an aspect of the present disclosure to enable an input and output (I/O) system beyond simple predictive text entry systems to include person, context, application in use, dialect, prior words entered, or historical word patterns associated with a user to auto-correct, suggest, or select certain letters. The system may also analyze spoken voice from a user based on similar factors to appropriately convert audio to text and suggest words or sentences. The device may download a thesaurus or dictionary or query a dictionary or thesaurus located on a server in delayed or real time as a user is typing on the CT/MD to provide suggestions to the user. The device may query a server in real time to display thesaurus related output as a user types.

The server may collect and use the responses and corrections from a plurality of users and devices to improve the predictive text system. The predictive text system may connect to a crowd-sourced predictive text database that may be localized for certain regions or countries. The database may map incorrect spellings to suggested words to accepted or used words. The database may score the number of times that an incorrect word is mapped to the suggested and accepted words to refine the database. As an example, the server may store in memory the recommendation of a suggested word to a user on a CT/MD. If the user in turn chooses not to change the word, the server may mark this entry as not having been suggested and not changed. If a user chooses to change the response, the server records the suggested word or words and the ultimate word entered. The server may record the time, location, entire sentence, paragraph, or words immediately preceding and after the operative word in the predictive text system. The server may record the specific name and contact information in a document, email, or text message to determine a mapping between a suggested word and the contact. As an example, an individual may use colloquial language with close contacts but more formal language with coworkers. The predictive text system may create a specific data file for contacts classified in various categories and suggest the appropriate words based on these categories.

It is an aspect of the present disclosure to allow an individual to use an input and output method that includes predefined sentences and phrases to allow for easy composition of messages. The device may also display by default a keyboard specific to the contact. When composing a message to a contact who uses English to communicate may bring up by default an English keyboard. A contact who uses Japanese to communicate may bring up a Japanese keyboard by default. A single CT/MD may dynamically switch between displaying these keyboards based on the current contact being viewed. These keyboards may further include pre-defined, frequently used phrases, or statements customized specifically for the contact, time of day, and location. For example if a given contact is a parent, the keyboard or area above the keyboard may display phrases such as "I will be home in 30 minutes." This area may suggest a variety of words, phrases, partial sentences, full sentences or paragraphs. These suggestions may be learned automatically by for example a machine learning system based on phrases from the specific user in their discussions with the user they are presently dialoging with or from all users they dialog. Language preferences for each individual may be based on the country code or area code in a phone number, stated preferences of the individual, or a database stored on the CT/MD or server.

Gestures and Touch for UI Control and Authentication:

It is an aspect of the present disclosure to enable the touch based system to be fully configurable by a user, administrator, or server device. For example, a left swipe motion of a hand